SLOVENSKI STANDARD
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Zahteve za preskušanje pribora za nizkonapetostne izolirane nadzemne kable - 6. del: Okoljsko preskušanje

Test requirements for low voltage aerial bundled cable accessories - Part 6: Environmental testing

Prüfanforderungen für Bauteile für isolierte Niederspannungsfreileitungen - Teil 6: Umweltprüfungen

Prescriptions relatives aux essais des accessoires pour réseaux aériens basse tension torsadés - Partie 6: Essais d'environnement

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English Version

Test requirements for low voltage aerial bundled cable accessories - Part 6: Environmental testing

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This draft European Standard is submitted to CENELEC members for enquiry.
Deadline for CENELEC: 2025-01-10.

It has been drawn up by CLC/TC 20.

If this draft becomes a European Standard, CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

This draft European Standard was established by CENELEC in three official versions (English, French, German).
A version in any other language made by translation under the responsibility of a CENELEC member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

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Recipients of this draft are invited to submit, with their comments, notification of any relevant patent rights of which they are aware and to provide supporting documentation.

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European Committee for Electrotechnical Standardization
Comité Européen de Normalisation Electrotechnique
Europäisches Komitee für Elektrotechnische Normung

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European foreword

This document [prEN 50483-6:2024] has been prepared by WG 11 of CLC/TC 20, “Electric cables”.

This document is currently submitted to the Enquiry.

The following dates are proposed:

• latest date by which the existence of this document has to be announced at national level	(doa)	dav + 6 months
• latest date by which this document has to be implemented at national level by publication of an identical national standard or by endorsement	(dop)	dav + 12 months
• latest date by which the national standards conflicting with this document have to be withdrawn	(dow)	dav + 36 months (to be confirmed or modified when voting)

This document will supersede EN 50483-6:2009 and all of its amendments and corrigenda (if any).

prEN 50483-6:2024 includes the following significant technical changes with respect to EN 50483-6:2009:

This is Part 6 of CENELEC standard EN 50483 “Test requirements for low voltage aerial bundled cable accessories”, which has six parts:

— Part 1: Generalities;

— Part 2: Tension and suspension clamps, fittings and brackets for self supporting system;

— Part 3: Tension and suspension clamps for neutral messenger system;

— Part 4: Connectors;

— Part 5: Electrical ageing test;

— Part 6: Environmental testing.

Introduction

The objective of the EN 50483 series is to provide a method of testing the suitability of accessories when used under normal operating conditions with low voltage aerial bundled cables (ABC) complying with HD 626.

Climate differs across Europe and in order to meet the differing geographic climatic conditions it is necessary to provide a range of tests to meet these variations. A range of optional, additional tests is provided to meet the varying climatic needs and these should be agreed between the customer and the manufacturer and/or the supplier (see Annex C).

This European Standard does not invalidate existing approvals of products achieved on the basis of national standards and specifications and/or the demonstration of satisfactory service performance. However, products approved according to such national standards or specifications cannot directly claim approval to this European Standard. It may be possible, subject to agreement between the customer and the manufacturer and/or the supplier, and/or the relevant conformity assessment body, to demonstrate that conformity to the earlier standard can be used to claim conformity to this standard, provided an assessment is made of any additional type testing that may need to be carried out. Any such additional testing that is part of a sequence of testing cannot be done separately.

1 Scope

EN 50483 series applies to overhead line fittings for tensioning, supporting and connecting aerial bundled cables (ABC) of rated voltage U_0/U (U_m): 0,6/1 (1,2) kV.

This Part 6 defines the environmental tests in particular the climatic and corrosion ageing tests. The objective of these tests is to predict the behaviour of ABC accessories when subjected to sun radiation, to weather conditions (humidity, spraying water, heat, cold) and pollution. EN 50483-1, EN 50483-2, EN 50483-3 and EN 50483-4 specify which type tests included in this part of the standard are needed.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

prEN 50483:2024 (series), *Test requirements for low voltage aerial bundled cable accessories*

EN IEC 60068-2-5:2018, *Environmental testing – Part 2-5: Tests – Test S: Simulated solar radiation at ground level and guidance for solar radiation testing and weathering (IEC 60068-2-5:2018)*

EN IEC 60068-2-11:2021, *Environmental testing – Part 2: Tests – Test Ka: Salt mist (IEC 60068-2-11:2021)*

EN ISO 22479, *Corrosion of metals and alloys - Sulfur dioxide test in a humid atmosphere (fixed gas method) (ISO 22479)*

IEC 60050-461, *International Electrotechnical Vocabulary (IEV) – Part 461: Electric cables*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in IEC 60050-461 and the following apply.

ISO and IEC maintain terminology databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at https://www.iso.org/obp/

— IEC Electropedia: available at https://www.electropedia.org/

3.1
aerial bundled cable (ABC)
aerial cable consisting of a group of insulated conductors which are twisted together including, or not, a non insulated conductor

Note 1 to entry: The terms bundled conductors, bundled cables, bundled cores, conductor bundles and bundle could be used as equivalent to the term aerial bundled cable (ABC).

[SOURCE: IEV 461-08-02, modified]

3.2
aerial-insulated-cable
insulated cable designed to be suspended overhead and outdoors

[SOURCE: IEV 461-08-01]

3.3
conductor (of a cable)
part of a cable which has the specific function of carrying current

[SOURCE: IEV 461-01-01]

3.4
core
assembly comprising conductor and its own insulation

[SOURCE: IEV 461-04-04, modified]

3.5
fixture (or fitting)
device for attaching ABC tension or/and suspension clamps to a pole or to a wall

3.6
insulation (of a cable)
insulating materials incorporated in a cable with the specific function of withstanding voltage

[SOURCE: IEV 461-02-01]

3.7
type test
test required to be made before supplying a type of material covered by this standard on a general commercial basis, in order to demonstrate satisfactory performance characteristics to meet the intended application

Note 1 to entry: These tests are of such a nature that, after they have been made, they need not be repeated unless changes are made to the accessory materials, design or type of manufacturing process which might change the performance characteristics.

4 Symbols

λ_1 and λ_2	wavelength of UV light source
E_m	mean energy received by the samples
E	radiated energy of the lamp
n	number of cycles (defined in appropriate part of this standard)
θ	temperature measured by the black standard thermometer
θ_E	temperature of the chamber

5 Marking

Marking shall be according to Clause 6 of prEN 50483-1:2024.

6 Type tests

6.1 Number of test samples and number of cycles

The number of samples and number of cycles for each of the following tests are included in each relevant part of EN 50483.

6.2 Requirements

The requirements for the following tests shall be as given in the relevant parts of this standard.

6.3 Cleaning

On completion of the environmental tests, and between different environmental tests when carried out as a sequence, the samples shall, unless otherwise specified, be cleaned using running tap water for 5 min to 10 min and then by using demineralized water for the same period. The temperature of the water shall not exceed 35 °C. The samples shall be dried either by shaking by hand or using air blast to remove droplets of water.

6.4 Corrosion ageing tests

6.4.1 General

These tests shall be carried out when the products contain metallic parts (or parts protected with a metallic coating), which are exposed to the atmosphere.

A justification of the tests is given in Annex A.

6.4.2 Salt mist test

6.4.2.1 Principle

This test exposes samples to a neutral salt spray (concentration of NaCl: 5 %).

6.4.2.2 Test equipment

The test equipment is defined in Clause 6 of EN IEC 60068-2-11:2021.

6.4.2.3 Test arrangement

The preparation and use of the salt solution are defined in Clause 5 of EN IEC 60068-2-11:2021.

6.4.2.4 Procedure

The test procedure is defined in Clause 11 of EN IEC 60068-2-11:2021.

The connectors or accessories shall be installed as defined in the relevant parts of EN 50483.

The cycle duration prescribed, in accordance with EN IEC 60068-2-11:2021, 12.1 shall be 7 days.

No cleaning of the samples shall be carried out between cycles.

6.4.2.5 Test reports

The test report shall include the duration of exposure and the concentration and pH of the salt solution.

6.4.3 Gas atmosphere tests

6.4.3.1 General

Two methods of testing are provided to meet the requirements of the gas atmosphere test. A justification of the tests for the first method is given in Annex A.

NOTE 1 The first, Method 1, is based on the test procedure that has been used for many years in some countries. These countries have gained experience of both the procedures and outcomes of the test. The second, Method 2 is provided as an alternative as it requires a less complicated test environment and is based on ASTM G85.

NOTE 2 This test can be necessary for accessories that are used in areas subjected to heavy industrial pollution.

6.4.3.2 Gas atmosphere test (Method 1)

6.4.3.2.1 Principle

This test exposes samples to a humidity-saturated atmosphere rich with sulphur dioxide (initial concentration SO_2: 0,066 7 % (667 parts per million by volume)) with defined conditions of temperature and pressure.

6.4.3.2.2 Test equipment

The samples and supports shall be installed in a hermetic test chamber, with a humidity-saturated atmosphere in the presence of sulphur dioxide.

This test chamber shall be made of inert material. The test shall be made in accordance with EN ISO 22479.

6.4.3.2.3 Preparation of SO_2 atmosphere

After closing the chamber, sulphur dioxide (concentration = 0,066 7 %) shall be introduced from either a gas bottle or using a specific reaction in the chamber as described in Annex B.

6.4.3.2.4 Procedure

Each period, or basic module, shall comprise a weekly sequence.

7 cycles of 24 h (168 h total), each cycle includes an 8 h exposure with saturated humidity and high sulphur dioxide atmosphere (a total exposure of 56 h), and a 16 h exposure at the laboratory atmosphere (a total exposure of 112 h).

NOTE Exposure to laboratory atmosphere can be achieved by opening the chamber door. It is the intention of this phase to allow clean air to circulate around the test samples.

During the 8 h period, the temperature is raised to (40 ± 3) °C. During the 16 h period the chamber remains at ambient temperature and finally the water and sulphur dioxide atmosphere is renewed to the concentration as specified in 6.4.3.2.3.

6.4.3.2.5 Cleaning

When the specimens are exposed successively to a neutral salt spray and then to a humidity saturated atmosphere with sulphur dioxide, the procedure shall be

— 7 cycles of 24 h in salt,

— no cleaning,

— 7 cycles of 24 h in sulphur dioxide,

— cleaning in accordance with 6.3.

6.4.3.3 Gas atmosphere test (Method 2)

6.4.3.3.1 Procedure

The test samples shall be subjected to a cyclic corrosion test consisting of 1 h period of drying and 1 h period of fog. The test shall consist of 500 cycles (1 000 h). The fog period shall be at ambient temperature, while the drying time shall be at a higher temperature.

NOTE Experience indicates that longer cycle times can produce slower degradation.

6.4.3.3.2 Test equipment

The apparatus for salt spray (fog) testing consists of a fog chamber, a salt solution reservoir, a supply of suitable conditioned compressed air, one or more atomising nozzles, specimen supports, provision for heating